

## **Watershed Activity**

### **Standards**

#### **Science Standard 1 Analysis, Inquiry, and Design**

**S1.1 Ask "why" questions in attempts to seek greater understanding concerning objects and events they have observed and heard about.**

**S1.3 Develop relationships among observations to construct descriptions of objects and events and to form their own tentative explanations of what they have observed.**

**S6.2 Models are simplified representations of objects, structures, or systems, used in analysis, explanation, or design.**

Explore how erosion and deposition are the result of interactions between air, wind, water, and land. PS 2.1d

**Professional Development:** 3c Engaging students in learning

### **Content**

Students will understand that a watershed is an area of land into which water drains. Students will explore the effect of pollution in our watershed.

### **Day 1**

**Part 1: Where Will the Water Go? : Learning how bodies of water are formed. What is a watershed?**

### **30 minutes**

**What are some examples of bodies of water that you know?** generate a list and chart

How do you think lakes, rivers, streams, creeks, ponds, ocean (?) are created? Turn and talk with a neighbor.

Intro:

Let's consider a source of water, the rain. When it rains where does the rain go?

To study this question we are going to observe a bucket of rainwater we collected from the last rain as we pour it on the ground in the schoolyard (or park or parking lot). Take students to the yard with a bucket of water.

Have in mind an area near a drain or an inclined plane. ( It does not have to be a steep slope. Water will naturally go downhill to the nearest lower level)

Guiding Question:

What do you think will happen to the water when we spill it on the ground? Where will the water go?

After pouring the water, students observe where the water goes. Which way is the water moving? They will notice the water goes downhill and that lines of water will separate and meet at different points and join until it reaches the drain. Kids will get excited and run to follow the water and straddle the lines of water, which is part of engaging them.

Point out how there are streams of water that are like Rivers and water pools at certain areas like lakes or ponds that are fed by the river. It all flows down to one place which would be our oceans.

The land where we poured the water is called a watershed. It is the area of land where the water drains into one larger body of water.

What would happen if there was a spill of oil in part of this watershed or garbage or even soda spilled? What would happen to the water that collects in the drain? Is it going to be clean water? We are going to test that by making a model of a watershed in our classroom.

Back in the Classroom: If there is time in the period

The shape of the land plays an important part in how the water flows. These are examples of different land shapes or **Landforms**.

Depending on attention span of students or how in depth you want to go with your students. Download videos on a flashdrive to show students

[www.youtube.com/watch?v=c-Teyx3Nouk](http://www.youtube.com/watch?v=c-Teyx3Nouk) *Different Landforms* 1:39

\* [https://www.youtube.com/watch?v=KWTDmg8OI\\_Y](https://www.youtube.com/watch?v=KWTDmg8OI_Y) *Learning about Landforms* 4:41

<https://www.youtube.com/watch?v=mw9YIFoDzww> *Landforms of the Earth Preschool Kindergarten* 8:27

Visual charts of land formations:

<https://www.pinterest.com/pin/565483296933720275/>

<https://www.pinterest.com/pin/235805730464397083/>

<https://www.pinterest.com/pin/254031235205499024/>

\* Print a list of different landform vocabulary with definitions for each child to tape into their notebooks.

## **Day 2 Part 2 This Land is Your Land** 40 minutes

### Create a Model of a Watershed

Meeting: 10 minutes

Today we are going to make a model of a watershed out of different materials. You will have a choice of: newspaper, scrap paper, old clothing, paper cups

We will cover the land model with a shopping bag that we are recycling for another purpose. This is to make sure our land is waterproof. Then we will see what happens when we spray water on our landscape.

Explain as you model:

For example you can crumple the newspaper to create a landscape and tape it into place in the bottom of our bin. Then cut open the plastic bag. Cover and tape it into place. On our land will be some hills, mountains, valleys, plains, cliffs, plateaus etc. Discuss the parts of the land you recognize. Then sketch your land in your notebook and label the type of landforms you see on your model.

Chart the Procedure:

Our title is This Land is Our Land

Tape your vocabulary in your notebook

Discuss the materials you will need with your team. Choose 1 material for your table/team.

Everyone table will get 1 plastic bag to cut open and tape.

Send your (engineer) to the materials station.

After creating the model of land, tape plastic bag on top to cover it.

See if you can identify any of the landforms.

Draw a sketch in your notebook of your land.

label your land forms (If they have learned about keys you can have them create a key to label their landforms)

Materials:

Per team: large tin or bin, (newspaper, fabric, scrap paper or tin foil) plastic bag, tape, water bottle spray.

(Previously send home a letter to families informing them about the unit and activity asking for some of these materials)

Activity: 15 minutes Making the Watershed Model

Questions to ask students: Where do you think the water will go?

Discuss and write Predictions in your notebook.

Clean up: 5 minutes.

Children will put the unused materials back at the materials station.

**Let It Rain** 10 minutes

Stop Look and Listen:

Now we are going to test what happens when we spray water on our land as if it were rain. Each team member will spray for 15 seconds on the landscape and pass it to each team member.

Observe where the water goes. Do you see any lakes, rivers, streams? where is your ocean? Is there more than one river system? Can you predict where the water is going to go as you spray?

Draw and write in your notebook what you observe.

(\* Might want to add food color to the water so it is easier to see where the water goes.

clean up: pour the water from your Watershed into a container. Place the watershed models on the windowsill shelf. Allow time for the watershed models to dry.

Share: Discuss what you noticed

### **Part 3 Human Impact on our resources** Day 3

Do you think water is important?

Why is it important? class discussion or turn and talk.

Discuss water facts:

In your notebook, you will draw a line under your last observation and write the question?

What will happen if we put pollute the land in our watershed?

Materials:

watershed models

Markers or food coloring

glitter, paper circles from hole punching, small bits of paper.

[http://pbskids.org/plumlanding/educators/activities/build\\_a\\_watershed\\_ed.html](http://pbskids.org/plumlanding/educators/activities/build_a_watershed_ed.html)

We are going to see what happens when we put a mark on our landscape with a marker, as well as other small bits of garbage that we will use glitter, hole punch circles etc..We are pretending this marker is oil spills from a truck, maybe or dangerous drycleaning chemicals. (think of other examples of pollution ) The smaller pieces are like litter.

We will mark an x on different spots on our landscape with a marker. Make 3 marks in different spots. Each spot will be a different color. Then each team member will spray for 15 seconds. What will happen to the marker and litter? What will happen to the water?

First we are going to write a prediction in our notebook. We already did this experiment once. We observed what happens when just clean water rains down on land. Scientists make predictions based on what they already know. Based on what you already know about landforms and water flow, what do you think will happen to the pollution that is on the land?

Here is a rubric to check in and see if you have what you need for your prediction. If you think you need to add more information, then edit.

Writing Activity : 15 minutes

Stop Look and Listen

Now we will get the material. Send your engineers to the material station.

Take a teaspoon of each material and 3 markers

First spread the Pollution, then Spray the rain.

Record your results in your notebook.

clean up- pour the water into a container. Have helpers pour that over a sieve and place bits on a tray to dry for next class.

Share: Discussion 10-15 minutes

What did you notice?

What happens to a pool of water that has pollution in its watershed?

What would happen to the animals and plants that live in water where their watersheds that have toxic pollutants? What if that is our drinking water?

How do people change our environment in harmful ways? How can we change our behavior to help our environment?

## **Day 5 Part 4 CLEANING WATER Activity**

Adapted from the Clean Water Activity from NASA's KSNN™ 21st Century Explorer newsbreak "Where would a space explorer find water and oxygen?"

goals: properties of different types of soils sediment

engineers: Designing a solution to a problem

process skills : measuring, planning an experiment and following the procedure, handling materials

Science Content: Students will understand that layers of rock under the surface and the natural aquifer that cleans ground water.

We are lucky in NY because our watershed is protected. But other places have to treat their water because their watershed is not so clean. What can people do if their water is already contaminated or not so clean? Turn and talk with a neighbor?

The astronauts onboard the International Space Station (ISS) join those of us on Earth in the recycling effort. They recycle their water and that includes the moisture they exhale, sweat, and the water they use to shower and shave. These wastewaters are purified and then used as drinking water.

We are going to do an experiment to design a way to clean water. Suppose you are sent on a mission in a spaceship far from earth. You land on Mars and for some reason you can't get back to earth right away. You need to wait for another spaceship to take you back. (Science Fiction book Martian about an astronaut who was left behind on Mars where there is no usable water or air. He had to be very creative and engineer solutions to purify or clean his water supply) . You see that you are running out of water soon. These are the only materials you have. Luckily some of the materials are the earth materials that we were exploring (pebbles, sand, clay ). You brought them to compare them to Mars rocks. Remember when we experimented to find out which type of earth materials holds the most water. Discuss what you and your team can make to clean the water that is dirty so that you can live. Draw a design in your notebook. Option: each draw a design and pick 2 to try out.

These are your materials: If there is another material you don't see here, write it on the board.

Materials:

pebbles, sand, clay, gravel a teaspoon of each

coffee filter

stocking

cups with holes

jars

Prepare: soiled water

It might take to class periods for this project.

At the end show a video or example of a natural aquifer. Explain that groundwater is cleaned of most pollutants unless something seeps in that is too small to get filtered. That is where well water comes from.

<http://www.discovery.com/tv-shows/other-shows/videos/assignment-discovery-shorts-aquifers/>

Part 6 Extension : Project create posters or puppet show or skit to explain how we can reduce pollution and protect our environment

ideas for projects <http://www.groundwater.org/kids/getinvolved/protect.html>

Include discussions, informational videos, fun upcycling projects.

Its great to clean the water but how about reducing the amount of pollution we create to begin with. What are some ways we can cut down on the pollution we create?

(they will probably say put garbage in a garbage can) Where does that garbage go? Landfills which can hurt the air.

If that is too complicated for the classes I have, I can do an upcycling project like the milk carton purse for example, or launch a campaign to terracycle in the school.